

REMARKS

I. Status of the claims

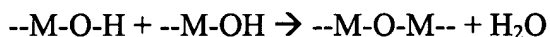
Claims 39, 41-43, 59-85, and 89-98 are pending. Claims 44-58 and 86-88 were withdrawn as being directed to a non-elected invention. The subject matter of claim 40 has been incorporated into claim 39 and claim 40 has been cancelled. No new matter has been introduced through this amendment.

II. Rejection under 35 U.S.C. § 112, second paragraph

The examiner has rejected claims 39-43, 59-85, and 89-98 under 35 U.S.C. § 112, second paragraph as being indefinite. This rejection involves three separate rejections, addressed as A-C below.

A. The examiner states that the expression “the metal alkoxide and its condensation product” recited in claim 39 renders the claim indefinite. The examiner notes the reference “Encyclopedia of Chemical Technology” referred to by Applicants in the last response is not available. This reference (volume 32, pages 35-52) is included for the examiner’s consideration in this response.

Additionally, Applicants note that the expression, “metal alkoxide and its condensation” is part of the larger expression “an amount of water sufficient for at least partial hydrolysis of the metal alkoxide and its condensation.” In this context, the claim term becomes clear. As known in the art of sol-gel processes, condensation reactions follow the hydrolysis of the alkoxide metal according to the following reactions:



These reaction mechanisms are explained in greater detail in Chapter 3 of the literature reference “Sol-Gel Science” by C. Jeffrey Brinker and G.W. Scherer, Academic Press, Inc. (1990), a copy of which is included in this response for the examiner’s consideration.

B. The examiner states that the term “modified natural polymer” recited in claims 67 and 93 renders those claims indefinite because it is not clear what polymer would be considered as a “modified natural polymer.” However, the term “modified natural polymer” has a clear

definition to those of skill in the art and does not need to be defined with greater specificity. Applicants have conducted a search on the U.S. Patent and Trademark Office's website for the term "modified natural polymer" and uncovered 463 U.S. patents that contain this term in the specification, providing evidence that this term is well-known in the art. Applicants provide the examiner a print-out of the first pages of this search for the examiner's consideration.

C. The examiner states that the term "sol" recited in claim 82 renders the claim indefinite because the claim is not understood. The examiner notes the reference "Encyclopedia of Chemical Technology" referred to by Applicants in the last response is not available. This reference (volume 22, pages 497-528) is included for the examiner's consideration in this response. Additionally, Applicants refer the examiner to the "Sol-Gel Science" reference cited by Applicants in the previous paragraph for another example showing how this term is known in the art.

In view of the above remarks, Applicants submit that each of these claim terms is clear on its face. Accordingly, Applicants respectfully request that the examiner withdraw these rejections under 35 U.S.C. § 112, second paragraph.

III. Rejection under 35 U.S.C. § 103(a)

The examiner has rejected claims 39-43, 59-85, and 89-98 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,352,699 or PCT Application No. WO 98/44906 to Mondet et al. ("Mondet") in view of U.S. Patent No. 5,700,451 to Yue et al. ("Yue"). Applicants respectfully traverse this rejection.

Applicants have unexpectedly discovered that using a UV-A sunscreen agent having a maximum absorption wavelength of less than 370 nm, when used with components recited in the claimed invention, provides a material that has a maximum absorption wavelength ranging from 370 to 400 nm. While the material exhibits the benefits of maximum absorption wavelength shifted to the higher range, the material still retains a ϵ value that has not been significantly reduced. The shifting of the maximum absorption wavelength of a UV-A sunscreen agent was unexpected and neither taught nor suggested in Mondet or Yue.

The unexpected results claimed by Applicants are supported by the examples. Examples 1-3 have been prepared in accordance with the invention and show the claimed shift in the maximum absorption wavelength. In Example 1, the absorption band shifted from 358 nm to 378 nm; in Example 2, the absorption band shifted from 358 nm to 385 nm; and in Example 3, the absorption band shifted from 358 nm to 370 nm. In each of these examples, the effectiveness of the material after the absorption band had shifted was not significantly reduced: the material was able to form a film, was entirely persistent toward water and ethanol, and was not released under the conditions in polar and non-polar cosmetic oils. See specification, pages 23-25.

Neither Mondet nor Yue teach or suggest that the introduction of a UV-A sunscreen having a maximum absorption wavelength of less than 370 nm can shift the maximum absorption wavelength of a material to a range of 370 to 400 nm. Mondet, by the examiner's own admission, does not teach a composition that even contains a UV-A sunscreen agent. Therefore, Yue is the only reference relied upon by the examiner to teach a UV-A sunscreen agent. However, it cannot be expected that introducing the UV-A sunscreen agent taught in Yue into the composition taught by Mondet would produce the claimed shift in maximum absorption wavelength. There is nothing in the disclosure of either Mondet or Yue to suggest that such a shift in maximum absorption wavelength is even possible, let alone predictable.

In the Office Action, the examiner states that it is known that sunscreen agents can be incorporated into the composition of Mondet; therefore, any sunscreen agents, including the one taught by Yue, would be reasonably expected to be *useful* to be incorporated into the composition of Mondet, absent evidence to the contrary. The examiner's statement misses an important aspect of the claimed invention. Applicants' invention does not simply involve adding a sunscreen agent to a composition to make that composition *useful*. Rather, Applicants' invention involve introducing a particular sunscreen agent to a particular composition to provide a material where the maximum absorption wavelength as shifted. This phenomenon, outside Applicants' own disclosure, has not been taught or suggested in the art.

The Mondet and Yue references are discussed in detail below.

Mondet relates to a cosmetic or dermatological composition forming, on a deratin substrate, a film in cross-linked hybrid material. Mondet teaches a particular sol-gel material

allowing the formation of a film which can withstand a large number of washes. However, Mondet fails to teach (a) the choice of particular alkoxides; (b) the presence of a sunscreen agent; (c) the choice of a UV-A sunscreen agent; and (d) the choice of a UV-A sunscreen agent having a maximum absorption wavelength of less than 370 nm. Certainly, there is no teaching in Mondet that the introduction of a particular UV-A sunscreen agent having a maximum absorption wavelength of less than 370 nm in a material that would result in the material having a significantly different maximum absorption wavelength relative to the particular UV-A sunscreen agent, with an ϵ value which is not significantly different.

Yue fails to cure these deficiencies. Yue describes topical compositions comprising a cosmetically acceptable topical carrier and anatase/amorphous TiO_2 in the form of a hydrogel or particles. Yue teaches that a hydrogel is beforehand prepared only from titanium compounds. There is no active ingredient, such as a sunscreen agent, used in the preparation of the hydrogel. The hydrogel is then used as such or dried in order to obtain particles. The TiO_2 thus obtained is mixed with a cosmetically acceptable carrier, leading to the final composition. See examples 1-4.

The composition can further comprise other ingredients such as those described in col. 7, line 60 to col. 13, line 2. Among the listed ingredients are sunscreens, but there are no exemplified compositions in Yue that contain an organic sunscreen. Moreover, there is no disclosure in Yue to motivate a skilled artisan to shift the absorption band of a UV-A sunscreen having a maximum absorption wavelength of less than 370 nm.

Neither Mondet nor Yue, when considered alone or in combination, lead one skilled in the art to trap the particular UV-A sunscreen agent in a specific sol-gel matrix obtained from particular alkoxides to produce a material having a shifted maximum absorption wavelength. This conclusion of nonobviousness is further buttressed by Applicants' claimed and exemplified unexpected results. Accordingly, Applicants request that the examiner withdraw this rejection.

IV. Conclusion

Applicants believe the application is in condition for allowance and respectfully request early notification to that effect. If there are any outstanding issues, the examiner is encouraged to

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contact the undersigned counsel to expeditiously resolve such issues.

The Commissioner of Patents is authorized to charge any fees or credit any overpayments associated with this application to Deposit Account No. 033975.

Respectfully submitted,

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